

## CLAIMS

We claim:

1. A reference voltage generator for a driver comprising:  
at least one reference voltage;  
5 at least one current control signal; and  
at least one active device coupled to a selected reference voltage level of the at least one reference voltage and the at least one current control signal, the at least one active device shifting the at least one reference voltage based on the at least one current control signal.  
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2. The reference voltage generator of claim 1, wherein the at least one reference voltage comprises three reference voltage levels.
3. The reference voltage generator of claim 1, wherein the at least one  
15 reference voltage comprises more than three reference voltage levels.
4. The reference voltage generator of claim 1, wherein the at least one reference voltage is generated on at least one reference voltage driver.
- 20 5. The reference voltage generator of claim 1, wherein the at least one reference voltage is generated on a voltage divider.
6. The reference voltage generator of claim 1, wherein the selected reference voltage is a highest voltage reference associated with the at least one voltage  
25 reference.
7. The reference voltage generator of claim 1, wherein the at least one current control signal comprises an equalization current control signal.
- 30 8. The reference voltage generator of claim 1, wherein the at least one current control signal comprises a crosstalk current control signal.

9. The reference voltage generator of claim 1, wherein the at least one current control signal comprises an equalization current control signal and a crosstalk current control signal.

5 10. The reference voltage generator of claim 1, wherein the at least one active device comprises a current source shifting the at least one reference voltage based on the at least one current control signal.

10 11. The reference voltage generator of claim 10, wherein the current source shifts the at least one reference voltage down.

12. The reference voltage generator of claim 1, wherein:  
the at least one reference voltage is generated on a resistive voltage divider coupled to a reference voltage; and  
15 the active device is coupled to a highest reference voltage generated on the voltage divider, the active device shifting the at least one reference voltage based on the at least one current control signal and resistor values associated with the resistive voltage divider.

20 13. The reference voltage generator of claim 1, wherein the at least one current control signal is based on a voltage shift of a highest level associated with the driver.

25 14. The reference voltage generator of claim 1, wherein the driver comprises a current mode driver.

15. The reference voltage generator of claim 14, wherein the current mode driver comprises multi-level current mode driver.

30 16. The reference voltage generator of claim 1, wherein the driver is arranged to operate in a 2-PAM mode or a 4-PAM mode.

17. A method for generating at least one reference voltage level for a driver, the method comprising:

providing at least one reference voltage level;

providing at least one current control signal, the current control signal based  
5 on a logic-state level shift associated with the driver; and

adjusting the at least one reference voltage level based on the at least one current control signal.

18. The method of claim 17, wherein the step of providing the at least one  
10 reference voltage level comprises generating at least one reference voltage level on a resistive voltage divider.

19. The method of claim 17, wherein the level shift associated with the driver is based on an equalization signal applied to the driver.

20. The method of claim 19, wherein the level shift is further based on a crosstalk signal.

21. The method of claim 17, wherein the step of adjusting the at least one  
20 reference voltage level comprises shifting down the at least one reference voltage level based on the at least one current control signal.

22. A memory bus system comprising:

a bus including a plurality of signal lines;

25 at least one reference voltage;

a plurality of drivers employing at least one control signal; and

an active device associated with each of the plurality of drivers, the active device coupled to a highest reference voltage level of the at least one reference voltage and the at least one control signal, the active device arranged to shift the at least one  
30 reference voltage based on the at least one control signal.

23. The memory bus system of claim 22, wherein the memory system is arranged to operate as a 2-PAM system or a multi-PAM system.

24. The memory bus system of claim 22, wherein the at least one control  
5 signal comprises at least one current control signal.

25. The memory bus system of claim 24, wherein the at least one current control signal comprises an equalization signal.

10 26. The memory bus system of claim 25, wherein the at least one current control signal further comprises a crosstalk signal.